



US009926986B2

(12) **United States Patent**  
**Hartz et al.**

(10) **Patent No.:** **US 9,926,986 B2**  
(45) **Date of Patent:** **\*Mar. 27, 2018**

(54) **CONNECT-DISCONNECT APPARATUS FOR  
A VEHICLE DRIVETRAIN**

(71) Applicant: **Allison Transmission, Inc.,**  
Indianapolis, IN (US)

(72) Inventors: **James F. Hartz**, Indianapolis, IN (US);  
**Rick K. Daugherty**, Clayton, IN (US);  
**Rick L. Platt**, Indianapolis, IN (US);  
**Brian L. Pannell**, Fortville, IN (US)

(73) Assignee: **Allison Transmission, Inc.,**  
Indianapolis, IN (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 55 days.

This patent is subject to a terminal dis-  
claimer.

(21) Appl. No.: **14/947,105**

(22) Filed: **Nov. 20, 2015**

(65) **Prior Publication Data**

US 2016/0076648 A1 Mar. 17, 2016

**Related U.S. Application Data**

(63) Continuation of application No. 14/332,944, filed on  
Jul. 16, 2014, now Pat. No. 9,309,931.

(51) **Int. Cl.**

**F16D 11/14** (2006.01)

**F16D 23/12** (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC ..... **F16D 11/14** (2013.01); **B62D 55/125**  
(2013.01); **F16D 23/12** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC .... F16D 11/14; F16D 2011/004; F16D 23/12;  
F16D 2023/123; B62D 11/186;

(Continued)

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,504,564 A \* 4/1970 Kell ..... F16H 1/28  
192/69.9

4,040,312 A \* 8/1977 Tappan et al. .... F16H 47/04  
475/342

(Continued)

**OTHER PUBLICATIONS**

Korean Intellectual Property Office. International Search Report and  
Written Opinion of the International Searching Authority issued in  
Application No. PCT/US2014/046866. dated Apr. 10, 2015. 11  
Pages.

*Primary Examiner* — Richard M Lorence

(74) *Attorney, Agent, or Firm* — Taft Stettinius &  
Hollister LLP; Stephen F. Rost

(57) **ABSTRACT**

A connect-disconnect assembly for a vehicle drivetrain configured to drive a vehicle with a surface engaging traction member. The connect-disconnect assembly includes a coupler located within a final drive element or gear of a final drive assembly wherein in a first position the coupler does not span a gap between the gear and a transmission drive element of a transmission. In a second position, the coupler does span the gap between the gear and the transmission drive element such that the gear and the transmission drive element are connected. The final drive assembly includes an access port to provide access to a user accessible drive actuator to move the coupler between the first and second positions.

**15 Claims, 4 Drawing Sheets**

